WHAT IS CLAIMED IS:

1. A clock extraction apparatus for an optical signal, comprising:

optical branching means for branching an optical signal, which has been transmitted from a transmitting end to a receiving end, into a plurality of optical signals to be transmitted to a plurality of paths;

optical filtering means for simultaneously reflecting a center wavelength and a specific side peak wavelength of the optical signal, which has been transmitted to a first path of the plurality of paths, to the optical branching means, the specific side peak wavelength being spaced apart from the center wavelength by a clock frequency; and

clock extraction means for extracting a clock by detecting a beating signal from the center wavelength and the specific side peak wavelength reflected to the optical branching means.

2. The clock extraction apparatus according to claim 1, further comprising clock amplification means for amplifying the center wavelength and the specific side peak wavelength reflected from the optical filtering means to the optical branching means.

3. The clock extraction apparatus according to claim 2, further comprising noise filtering means for removing optical noise included in the output of the clock amplification means.

4. The clock extraction apparatus according to claim 1, wherein the optical filtering means has a main reflection band and a sub-reflection band, and reflects each of the wavelengths in each of the reflection bands.

5. The clock extraction apparatus according to claim 4, wherein the optical filtering means reflects the side peak wavelength using the main reflection band, and reflects the center wavelength using the sub-reflection band.

6. The clock extraction apparatus according to claim 4, wherein the optical filtering means adjusts reflectivities of the sub-reflection band and the main reflection band so that magnitudes of the center wavelength and the side peak wavelength are substantially equal after the wavelengths are reflected.

7. The clock extraction apparatus according to claim 1, wherein the optical filtering means reflects only the center wavelength and the specific side peak wavelength.

8. The clock extraction apparatus according to claim 1, further comprising a plurality of amplification means positioned at a fore end of the receiving end to amplify the side peak wavelength of the optical signal that will be transmitted to the receiving end.

9. The clock extraction apparatus according to claim 1,

wherein the transmitting end comprises:

optical amplifying means for amplifying the magnitude of one of the specific side peak wavelengths spaced apart from the center wavelength by the clock frequency.

10. The clock extraction apparatus according to claim 1, wherein the transmitting end comprises:

coupling means for adding an electrical clock signal to an electrical data signal used to modulate the optical signal that will be transmitted to the receiving end; and

optical modulation means for modulating the optical signal using an electrical signal obtained by adding the electrical clock signal to the electrical data signal.

11. The clock extraction apparatus according to claim 10, wherein the optical modulation means amplifies the specific side peak wavelength of the optically modulated optical signal.

12. The clock extraction apparatus according to claim 10, wherein the optical modulation means amplifies the optical signal so that a magnitude of the specific side peak wavelength of the optical signal is amplified to be greater than that of a specific side peak wavelength generated by a Non-Return-to-Zero (NRZ) modulation.

13. A clock extraction method for an optical signal, comprising the steps of:

receiving an optical signal transmitted from a transmitting end;

branching the optical signal into two or more optical signals;

optically filtering a first optical signal of the two or more optical signals by simultaneously reflecting the center wavelength of the first optical signal and a specific side peak wavelength spaced apart from the center wavelength by a clock frequency; and

extracting a clock by detecting the beating signal from the reflected center wavelength and specific side peak wavelength of the first optical signal.

14. The clock extraction method according to claim 13, further comprising the step of:

optically amplifying the extracted and reflected center wavelength and specific side peak wavelength of the first optical signal.

15. The clock extraction method according to claim 13 or 14, further comprising the step of:

removing optical noise added to the optically amplified center wavelength and the side peak wavelength.

16. The clock extraction method according to claim 13, wherein the step of optically filtering the first optical signal is performed by simultaneously reflecting each of the wavelengths in each of a main reflection band and a sub-

reflection band of an optical filter.

17. The clock extraction method according to claim 16, wherein the step of optically filtering the first optical signal is performed by reflecting the side peak wavelength using the main reflection band and reflecting the center wavelength using the sub-reflection band.

18. The clock extraction method according to claim 17, wherein the step of optically filtering the first optical signal is performed by adjusting reflectivity of the sub-reflection band so that magnitudes of the center wavelength and the side peak wavelength are substantially equal after the wavelengths are reflected.

19. The clock extraction method according to claim 13, further comprising the step of:

amplifying the side peak wavelength of the optical signal, which will be transmitted to the receiving end, at least once at a fore end of the receiving end.

20. The clock extraction method according to claim 13; further comprising the step of:

amplifying the center wavelength and specific side peak wavelength of the optical signal that will be transmitted to the receiving end, the specific side peak wavelength being spaced apart from the center wavelength by the clock frequency.

21. The clock extraction method according to claim 13, further comprising the step of:

amplifying only the specific side peak wavelength spaced apart from the center wavelength of the optical signal, which will be transmitted to the receiving end, by the clock frequency.

22. The clock extraction method according to claim 13, further comprising the steps of:

adding an electrical clock signal to an electrical data signal used to modulate the optical signal that will be transmitted to the receiving end; and

optically modulating the optical signal using an electrical signal obtained by adding the electrical clock signal to the electrical data signal, and amplifying the specific side peak wavelength.

23. The clock extraction method according to claim 22, wherein a magnitude of the specific side peak wavelength of the optical signal is amplified to be greater than that of the specific side peak wavelength generated by an NRZ modulation.